

## NATURAL RESOURCES CONSERVATION SERVICE

### CONSERVATION PRACTICE STANDARD

#### Upland Wildlife Habitat Management

(Acre)

Code 645

#### DEFINITION

Creating, restoring, maintaining or enhancing areas for food, cover, and water for upland wildlife and species which use upland habitat for a portion of their life cycle.

Harvesting or grazing by domestic livestock shall not be permitted, unless specified in an approved grazing plan.

Habitat shall be managed so that soil loss does not exceed tolerable limits.

#### PURPOSES

This conservation practice may be applied as part of a system to accomplish one or more of the following resource management objectives.

- Provide food for the desired wildlife species.
- Provide a variety of cover types for the desired wildlife species.

Native plant species shall be used whenever possible. Known non-native invasive species shall not be used.

An adequate water supply shall be provided for each desired species. The water supply shall come from either existing water sources or be developed using appropriate NRCS standards.

#### CONDITIONS WHERE PRACTICE APPLIES

On all landscapes that are suitable for the types of wildlife habitat that are needed within the range of the desired species or the natural community under consideration.

Additional criteria to provide food for the desired wildlife.

Food plots shall be rotated annually. Plant only 1/3 of the food plot each year. Allow the natural succession of forbs to occur on the remaining 2/3 of the food plot.

#### CRITERIA

##### General criteria applicable to all purposes

Habitat development and management shall achieve sustainable populations for specifically identified species and to meet the objectives of the land user.

The amounts and types of habitat elements planned, location, and management shall be identified in a management plan.

Food Plots shall be left standing throughout the winter and spring until replanted.

Planting shall occur early enough to allow species maturity before frost.

Seeding mixtures for food plots shall be chosen from Tables 1a and 1b.

If food plots are relocated or discontinued, the site shall be re-seeded to surrounding cover, based on this standard.

**Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.**

## FOOD PLOTS

**Table 1a. Annual food plot planting rates.**

Species	Single Species Rate (lbs./ac)	Multiple Species <sup>1</sup> Rate (lbs./ac)	Species Benefited
Milo	12	4	Deer, quail, turkey, pheasant, dove, songbirds
Corn	15	4	Deer, quail, turkey, pheasant, squirrels
Grain Sorghum	12	4	Deer, quail, turkey, pheasant, songbirds
White Proso Millet	12	4	Quail, turkey, pheasant, dove, songbirds
German/Pearl Millet	8	2	Deer, quail, turkey, pheasant, dove, songbirds
Oats	40	10	Deer, quail, turkey, pheasant, songbirds
Sunflowers	12	2	Deer, quail, turkey, pheasant, dove, songbirds
Cowpeas	20	5	Deer, quail, turkey, pheasant, dove
Soybeans	45	8	Deer, quail, turkey, pheasant
Partridge pea	10	2	Quail, turkey, pheasant
Buckwheat	20	8	Deer, quail, turkey, pheasant, songbirds
Wheat	25	10	Deer, quail, turkey, pheasant, doves, songbirds

<sup>1</sup> Total mix not to exceed 20 lbs./ac

**Table 1b. Perennial food plot planting rates.**

Species	Single Species Rate (lbs./ac)	Species Benefited
Alfalfa	6	Deer, quail, turkey, pheasant
Alsike clover	2	Deer, quail, turkey, pheasant
Ladino clover	1	Deer, quail, turkey, pheasant
Red clover	5	Deer, quail, turkey, pheasant

Additional criteria to provide a variety of cover types for the desired wildlife species.

Shrub species used to provide cover for the desired wildlife species shall be selected from Table 2.

Shrubs shall be planted in clumps or strips with spacing designed to meet the habitat requirements of the desired wildlife species. Clumps and strips shall have an irregular shape. Strips shall be planted based upon field configuration and wildlife habitat needs.

Tree species used to provide cover for the desired wildlife species shall be selected from Tables 3a, 3b, 3c and 3d.

Trees shall be planted in clumps or strips with spacing designed to meet the habitat requirements of the desired wildlife species.

Warm Season Grass, Legume and Forb species used to provide cover for the desired wildlife species shall be selected from Table 4.

Cool Season Grass, Legume and Forb species used to provide cover for the desired wildlife species shall be selected from Table 5.

Wildlife corridors shall include at least three rows of shrubs (see Table 2), one row of a soft mast tree species (see Table 3c), and one row of a hard mast tree species (see Table 3d). Mast is the fruit or nuts produced by certain tree species.

Tree and shrub plantings designed for wildlife corridors shall be based on wildlife species requirements. Corridors shall be a minimum width of 50 feet.

If needed, containerized (potted) stock shall be planted at a rate of 40 stems per acre. Clump planting of trees shall be considered when potted stock is likely to fail over large portions of a site due to flooding and wetness. Clumps will be placed on the highest elevations available on wet

sites. The maximum number of trees to plant in a clump shall be 80 trees per acre. The clump size shall be between ¼ acre and 1 acre unless site conditions suggest otherwise.

The container size for potted stock shall be a minimum of 1 gallon and the plant should be at least 3 feet tall with a minimum caliper of ½ inch. Stock shall be planted in a hole at least 12 inches in diameter with the root collar planted ½ inch below the ground line and the soil will be firmly packed around the roots to eliminate air pockets.

Plant containerized stock as local soil and weather conditions permit from September 15 to May 15. For further guidance on tree establishment techniques, see FOTG practice standard 612 Amendment to Tree/Shrub Establishment Potted Stock.

The following key for Soil Moisture Tolerance Ratings applies to tables 2, 3a, 3b, 3c and 3d.

<sup>1</sup> Key to Soil Moisture Tolerance Ratings

ED = Excessively Drained

WD = Well Drained

MWD = Moderately Well Drained

(Source: USDA Handbook No. 18, Soil Survey Manual, October 1993.)

SPD = Somewhat Poorly Drained

PD = Poorly Drained

VPD = Very Poorly Drained

**Table 2. Shrub List.**

Common Name <i>Scientific Name</i>	Soil Moisture Tolerance <sup>1</sup>	Average Mature Height (ft.)	Wildlife Information	General Comments
American Plum <i>Prunus americana</i>	MWD – ED	30	Fruit eaten by songbirds. Recommended for quail and turkey.	Reddish drupe.
Arrowwood <i>Viburnum dentatum</i>	MWD - WD	9	Fruit eaten by songbirds.	Drupe ¼” long, bluish-black.
Ash, Prickly <i>Xanthoxylum americanum</i>	SPD – WD	9		A thicket forming shrub with prickly leafstalks. Fruits are a small reddish-brown pod.
Blackhaw <i>Viburnum prunifolium</i>	MWD - WD	20	Fruit eaten by songbirds, quail, fox and turkey.	Drupe ½ “ long.
Bladdernut <i>Staphylea trifolia</i>	SPD – WD	10		3 lobed balloon like capsule.

Common Name <i>Scientific Name</i>	Soil Moisture Tolerance <sup>1</sup>	Average Mature Height (ft.)	Wildlife Information	General Comments
Chokecherry <i>Prunus virginiana</i>	SPD – WD	18	Fruit eaten by songbirds.	Grows in wide variety of sites. Fruit 1/3” long, dark-purple.
Chokeberry, Black <i>Aronia melanocarpa</i>	SPD – WD	10	Fruit eaten by songbirds. Recommended for turkey.	Fruit 1/3” long, dark-purple.
Coralberry <i>Symphoricarpos orbiculatus</i>	MWD - WD	5	Fruit eaten by songbirds, quail, and ruffed grouse.	Fruits coral to purple.
Devils Walking Stick <i>Aralia spinosa</i>	SPD - MWD	20	Fruit eaten by birds.	Showy white flowers that produce a black drupe.
Dogwood, Alternate Leaf <i>Cornus alternifolia</i>	SPD – WD	18	Fruit eaten by birds. Twigs browsed by deer and rabbits.	Blue-black fruit with red stems. Leaves not opposite.
Dogwood, Flowering <i>Cornus florida</i>	MWD - WD	30	Recommended for quail and turkey.	Showy flowers, glossy red drupe.
Dogwood, Gray <i>Cornus racemosa</i>	SPD – WD	8	Fruit eaten by pheasant turkey and grouse.	Red pedicles in winter, white drupe.
Dogwood, Red Osier <i>Cornus stolonifera</i>	VPD – WD	10	Fruit eaten by songbirds, grouse, quail and turkey. Twigs browsed by deer and rabbits.	Reddish stem, white drupe, good winter color.
Dogwood, Rough Leaved <i>Cornus drummondii</i>	PD – WD	18	Fruit eaten by songbirds, grouse, quail, turkey and pheasant. Browsed some by rabbits and deer.	White drupes.
Dogwood, Silky <i>Cornus amomum</i>	VPD – WD	10	Sometimes browsed by rabbits and deer.	Bluish fruit, likes moist soils and partial shade.
Eastern Wahoo <i>Euonymus atropurpureus</i>	SPD – WD	12	Fruit eaten by birds.	4 lobed red capsule, sometimes winged stem.
Elderberry <i>Sambucus canadensis</i>	VPD – WD	9	Fruit eaten by many birds including pheasant and dove. Plant contains hydrocyanic acid. Recommended for quail and turkey.	Purple-black drupe used for jams, jellies, pies, and wine.
Hazel Alder <i>Alnus serrulata</i>	VPD – WD	18	Deer browse on the twigs.	Prefers wet to moist soils. Long lenticles on the stem.
Hazelnut <i>Corylus americana</i>	MWD - WD	15	Small nut eaten by squirrels, deer, jays, grouse, and pheasant. Recommended for quail and turkey.	Often forms large colonies.
Highbush Cranberry <i>Viburnum trilobum</i>	VPD – WD	9	Fruit eaten by grouse, pheasant and songbirds. Recommended for turkey.	Tart red fruits. Showy.

Common Name Scientific Name	Soil Moisture Tolerance <sup>1</sup>	Average Mature Height (ft.)	Wildlife Information	General Comments
Indigobush <i>Amorpha fruticosa</i>	VPD – WD	6		Small pods, flowers purplish spikes.
Leadplant <i>Amorpha canescens</i>	WD – ED	3		Small erect prairie shrub with purple flowers.
Nannyberry <i>Viburnum lentago</i>	SPD – WD	18	Fruit eaten by songbirds. Recommended for turkey.	Blue-black fruits similar to raisins.
New Jersey Tea <i>Ceanothus americanus</i>	WD - ED	3	Quail and wild turkey eat the three-celled capsule that matures in fall.	Prairie plant with white flower in dense heads.
Ninebark <i>Physocarpus opulifolius</i>	VPD – WD	10	Fruit are small dry bladders lasting through winter. Recommended for turkey.	White to pinkish flowers.
Pawpaw <i>Asimina triloba</i>	SPD – WD	20	Fruit eaten by opossum, squirrels, raccoon, & fox.	Large leaves, likes deep moist soils.
Prairie Crab <i>Malus ioensis</i>	PD – WD	30	Fruit eaten by opossum, squirrel, raccoon and fox. Recommended for turkey.	Small fruit, showy flowers.
Redbud <i>Cercis canadensis</i>	MWD – WD	30	Seeds eaten by a few songbirds.	A legume, pod 2-3" long, reddish-purple flowers, heart shaped leaves.
Shrubby St. Johnswort <i>Hypericum prolificum</i>	SPD – WD	6		Bright yellow flowers, 3-valved capsule.
Spicebush <i>Lindera benzoin</i>	VPD – WD	9	Twigs and fruit eaten by songbirds, deer, rabbit, opossum, quail and grouse. Recommended for turkey.	Small red drupe.
Spirea <i>Spiraea alba</i> <i>Spiraea tomentosa</i>	VPD – WD	4	Spirea buds eaten by ruffed grouse. Twigs browsed by deer and rabbits.	Pink flowers. Also called Meadowsweet or Hardack.
Sumac, Shining <i>Rhus copallina</i>	MWD – ED	8	Fruit eaten by some songbirds, quail, dove, pheasant. Recommended for turkey.	Reddish fruit. Tolerates dry, infertile soils.
Sumac, Smooth <i>Rhus glabra</i>	MWD – ED	12	Twigs and fruit sometimes eaten by songbirds, quail, dove, and pheasant. Recommended for quail and turkey.	Often forms large colonies. Reddish fruit.

Common Name <i>Scientific Name</i>	Soil Moisture Tolerance <sup>1</sup>	Average Mature Height (ft.)	Wildlife Information	General Comments
Sumac, Staghorn <i>Rhus typhina</i>	MWD – ED	15	Fruit sometimes eaten by songbirds, quail, dove, pheasant. Twigs sometimes browsed by rabbits and deer. Recommended for turkey.	Tolerates dry, infertile soils. Reddish fruit.
Wild Blackberry <i>Rubus allegheniensis</i>	MWD – ED	5	Provides cover and food for birds and mammals. Recommended for quail and turkey.	Upright arching shrub with stout prickles.
Wild Raspberry <i>Rubus occidentalis</i>	MWD – WD	5	Provides cover and food for birds and mammals. Recommended for quail and turkey.	Arching shrub with strong hooked prickles.
Wild Sweet Crabapple <i>Malus coronaria</i>	SPD – ED	30	Recommended for quail and turkey.	Yellow-green edible fruit with highly fragrant flowers.
Witch-hazel <i>Hamamelis virginiana</i>	SPD – WD	18	Seeds, buds and twigs eaten by deer, rabbit, quail and pheasant.	Pale yellow flowers that produce pods with seeds.

Table 3a - Pine/Softwood Species

Common Name <i>Scientific Name</i>	Soil Moisture Tolerance <sup>1</sup>	Average Mature Height (ft.)	Wildlife Information	General Comments
Baldcypress <i>Taxodium distichum</i>	VPD – WD	80	Waterfowl occasionally consume seeds. Trees also serve as perching areas for song and wading birds.	The baldcypress is one of two deciduous conifer trees native to Indiana. Perhaps the most flood tolerant of our trees. Often forms elliptical crowns.
Cedar, Eastern Red <i>Juniperus virginiana</i>	SPD- ED	45	Berries consumed by songbirds. Recommended for turkey.	Small coniferous tree tolerant of dry, sterile soils.
Cedar, Northern White <i>Thuja occidentalis</i>	PD – WD	40	Foliage often browsed by deer in late winter as an emergency food source. Recommended for turkey.	This medium sized evergreen was once common in northern Indiana bogs. Attains best form on calcareous soils. Commonly planted ornamental.

Common Name <i>Scientific Name</i>	Soil Moisture Tolerance <sup>1</sup>	Average Mature Height (ft.)	Wildlife Information	General Comments
Pine, Eastern White <i>Pinus strobus</i>	MWD – WD	90	Pines make excellent roosting trees for many species of birds. Seeds are eaten by a wide variety of birds, squirrels and mice. Recommended for turkey.	Large tree capable of attaining heights of over 200 feet under ideal conditions. Bluish-green needles grow in-groups of five. Native only in a few spots in the west-central portion of the state.
Pine, Virginia <i>Pinus virginiana</i>	MWD – ED	40		Small sized tree with needle in-groups of two. Cones bear sharp prickles.

Table 3b. Non-mast Producing Species

Common Name <i>Scientific Name</i>	Soil Moisture Tolerance <sup>1</sup>	Average Mature Height (ft.)	Wildlife Information	General Comments
Aspen, Bigtooth <i>Populus grandidentata</i>	MWD - WD	70	Twigs and bark consumed by deer and beavers. Buds and catkins eaten by ruffed grouse.	Medium sized tree with olive-gray bark which becomes furrowed on older trees.
Cottonwood, Eastern <i>Populus deltoides</i>	PD – ED	90	Recommended for turkey.	Large tree typical of riverbanks. The triangle shaped (deltoid) leaves give this tree its specific name.
Sycamore, American <i>Platanus occidentalis</i>	PD – WD	90	Sycamore does not have much food value to wildlife, however, this species forms an important structural component of bottomlands and floodplains.	The sycamore has multicolored bark and is one of our largest trees. It is capable of attaining heights of over 100 feet.

Table 3c. Soft Mast Producing Trees

Common Name <i>Scientific Name</i>	Soil Moisture Tolerance <sup>1</sup>	Average Mature Height (ft.)	Wildlife Information	General Comments
Ash, Green <i>Fraxinus pennsylvanica</i>	VPD – WD	60	Seeds eaten by squirrels, quail and songbirds.	Medium sized tree, which is a common component of swamps and floodplains.
Ash, White <i>Fraxinus americana</i>	MWD – WD	70	Seeds eaten by squirrels, quail and songbirds. Recommended for turkey.	Common tree of upland forests. Forms a large straight bole with interlacing bark with age.
Birch, River <i>Betula nigra</i>	VPD - WD	50	Stands of birch serve as important cover for riparian dwelling animals.	Small to medium sized tree of floodplains. Has Cinnamon colored, exfoliating bark.
Cherry, Black <i>Prunus serotina</i>	MWD – WD	70	Familiar fruits eaten by many species of songbirds, ruffed grouse and pheasant. Recommended for turkey.	Tall tree of well drained soils. Valuable timber species that produces white blossoms and edible fruits.
Gum, Black <i>Nyssa sylvatica</i>	PD – WD	60	Fruits consumed by songbirds, and pileated woodpeckers. Recommended for turkey.	Medium sized tree, which thrives in both upland and wetland conditions. Foliage turns a red color in fall.
Hackberry <i>Celtis occidentalis</i>	SPD – WD	50	Fruits are sparingly consumed by songbirds, including cedar waxwings, mockingbirds, and robins, throughout winter. Recommended for turkey.	Small to medium sized tree of calcareous soils and floodplains. The taste of the fruits may be likened to dates, but contain a large seed.
Hawthorn, Cockspur <i>Crataegus crus-galli</i>	ED - SPD	30	Fruits make up an important winter food source for many species of songbirds including ruffed grouse. Fruit eaten by deer, fox, rabbit, pheasant and turkey. Excellent nesting habitat for songbirds.	Large shrubs or small trees that usually bear stout spines. White flowers yield small, apple like fruits. Common in disturbed woodlands that had previously been pasture.
Hawthorn, Green <i>Crataegus viridis</i>	ED - SPD	30		
Hawthorn, Washington <i>Crataegus phaenopyrum</i>	ED – SPD	30		
Kentucky Coffeetree <i>Gymnocladus dioica</i>	SPD – WD	50	Fruits relished by squirrels, opossum, raccoon and songbirds.	Uncommon, medium sized tree with gray, scaly bark. Fruit a thick, brown pod.

Common Name Scientific Name	Soil Moisture Tolerance <sup>1</sup>	Average Mature Height (ft.)	Wildlife Information	General Comments
Maple, Black <i>Acer nigrum</i>	MWD – WD	70	Samaras are widely consumed by birds and squirrels. Browsed by deer. Recommended for turkey.	Similar to sugar maple, but with leaves 3-lobed and darker green on top.
Maple, Red <i>Acer rubrum</i>	VPD – WD	70		Characteristic medium sized tree of swampy areas, but also found in upland conditions. Leaves turn scarlet red in fall.
Maple, Silver <i>Acer saccharinum</i>	VPD – WD	80		Exceptionally fast growing medium sized tree of floodplains and poorly drained soils. Small yellow (female) and reddish (male) flowers appear very early in the spring.
Maple, Sugar <i>Acer saccharum</i>	MWD – WD	70		One of the most common medium sized trees of well-drained woodlands. Five-lobed leaves turn a brilliant yellow-orange in fall.
Persimmon <i>Diospyros virginiana</i>	MWD – WD	50	Raccoons as well as some songbirds readily consume large berries.	Small tree found in bottomlands and old fields. Fruit, a large berry, is edible when ripe.
Serviceberry <i>Amelanchier arborea</i>	MWD – WD	30	Purplish fruits rapidly consumed by birds. Recommended for turkey.	Small, uncommon tree of well drained woodlands. Bark is smooth gray. Flowers are white and appear in April. This tree is also known as Juneberry because the fruit usually ripens in early summer.
Sweetgum <i>Liquidambar styraciflua</i>	PD – WD	85	Seeds consumed by “northern” finches in winter.	Large tree common in bottomlands of southern Indiana. Leaves are palmately five-lobed. Fruit is a prickly ball with multiple capsules.
Tuliptree <i>Liriodendron tulipifera</i>	MWD – WD	90	Seeds eaten by songbirds, quail, and turkey.	Common, large sized tree is a member of the magnolia family. Fruits are upright, aggregates of samaras, which remain on the twigs through winter.

Table 3d. Hard Mast Producing Trees

Common Name <i>Scientific Name</i>	Soil Moisture Tolerance <sup>1</sup>	Average Mature Height (ft.)	Wildlife Information	General Comments
Beech, American <i>Fagus grandifolia</i>	MWD – WD	75	Nuts consumed by deer, and squirrels. Recommended for turkey.	Extremely shade tolerant species with decorative smooth gray bark.
Buckeye, Ohio <i>Aesculus glabra</i>	SPD – WD	60	Nuts sparingly consumed by eastern fox squirrels.	Fast growing species. Twigs poisonous to livestock.
Butternut <i>Juglans cinerea</i>	MWD – WD	50	Elliptical nuts consumed by squirrels.	Small to medium sized tree with gray furrowed bark. Uncommon.
Hickory, Bitternut <i>Carya cordiformis</i>	SPD – WD	50	The nuts of these species constitute an important food source for squirrels and Wood ducks Recommended for turkey.	Medium sized tree of moist woodlands. Winter buds are sulfur-yellow. The common name is derived from the bitter taste of the nut.
Hickory, Mockernut <i>Carya glabra</i>	ED – MWD	50		Small to medium sized hickory whose name is derived from the small size of the sweet kernel, relative to the overall size of the nut.
Hickory, Pignut <i>Carya glabra</i>	WD – ED	50		Medium sized trees of well- drained soils.
Hickory, Shagbark <i>Carya ovata</i>	MWD – WD	70	The loose shaggy bark of shagbark hickory makes excellent roosting sites for bats. Recommended for turkey.	Medium sized tree typical of well-drained soils throughout Indiana.
Oak, Black <i>Quercus velutina</i>	MWD – ED	60	Acorns of these species constitute perhaps the most important food source for a variety of wildlife including woodpeckers, squirrels, and deer. Recommended for turkey.	Medium sized tree of well drained to dry soils. Bark is black and blocky.
Oak, Bur <i>Quercus macrocarpa</i>	PD – ED	80		Medium to large sized tree, which grows most typically in mesic woodlands and along floodplains, but is also very drought and fire tolerant. Large acorns with fringed caps.
Oak, Cherrybark <i>Quercus pagoda</i>	SPD – WD	75		Large tree of bottomlands and well-drained soils. In Indiana, found only in the extreme southwestern part of the state.

Common Name Scientific Name	Soil Moisture Tolerance <sup>1</sup>	Average Mature Height (ft.)	Wildlife Information	General Comments
Oak, Chinquapin <i>Quercus muhlenbergii</i>	MWD – ED	60	The smaller pin oak acorns are particularly favored by wood ducks.	Small to medium sized tree of calcareous soils and well-drained bottomlands. Bark is scaly with a yellowish cast.
Oak, Pin <i>Quercus palustris</i>	VPD – WD	75		Common medium sized oak of poorly drained soils and floodplains. Dead branches are seldom shed from the trunk of this species giving it a characteristic appearance.
Oak, Red <i>Quercus rubra</i>	MWD – WD	80		Common medium to large sized tree of mesic woodlands. Bark is blocky at the base of old trees while the upper portion of the trunk resembles “ski tracks”.
Oak, Scarlet <i>Quercus coccinea</i>	MWD – ED	70		Medium sized tree of dry ridges. Leaves turn a brilliant scarlet in autumn.
Oak, Shingle <i>Quercus imbricaria</i>	SPD – WD	50		Small to medium sized tree of mesic woodlands. Leaves remain on tree through winter, but unlike other oaks, the leaves of this species are unlobed.
Oak, Shumard <i>Quercus shumardii</i>	SPD – WD	75		Large sized tree of well-drained soils and bottomlands. Closely resembles red oak, but usually occurs in a lower position on the landscape.
Oak, Swamp Chestnut <i>Quercus michauxii</i>	SPD – WD	70		Medium to large sized tree of poorly drained soils. Bark may be confused with that of white oak, but the coarsely serrate margined leaves distinguish this species.
Oak, Swamp White <i>Quercus bicolor</i>	VPD – WD	70		Medium sized tree of poorly drained soils. The specific name, bicolor, refers to the two toned leaves which are dark and shiny above, and dull and white below.
Oak, White <i>Quercus alba</i>	MWD- WD	90		Tree with scaly, silvery bark.

Common Name <i>Scientific Name</i>	Soil Moisture Tolerance <sup>1</sup>	Average Mature Height (ft.)	Wildlife Information	General Comments
Pecan <i>Carya illinoensis</i>	SPD- WD	120	Ellipsoid nuts readily consumed by a variety of wildlife.	Large tree with sweet edible nuts.
Walnut, Black <i>Juglans nigra</i>	MWD – WD	80	Nuts consumed by squirrels.	Medium sized tree typical of central hardwood forests. Valuable timber species due to its long, straight boles. Bark chocolate colored and blocky with age.

**Table 4. Seeding Mixtures for Warm Season Grass, Legume and Forb Species.<sup>1</sup>**

Seeding Mixtures	Application Rate (lbs./ac of PLS <sup>2</sup> )	
	Wildlife	Vegetative
Big Bluestem	0.75	1
Indiangrass	0.75	1
Little Bluestem	1.75	2.5
Sideoats Grama	1	1.5
<sup>3</sup> Annual Lespedeza	2	2
Little Bluestem	2.5	4
Indiangrass	0.75	1
Sideoats Grama	0.75	1
<sup>3</sup> Annual Lespedeza	2	2

Seeding Mixtures	Application Rate (lbs./ac of PLS <sup>2</sup> )	
	Wildlife	Vegetative
<sup>4</sup> Switchgrass	1.75	2
Big Bluestem	1	2
Indiangrass	0.5	1
<sup>3</sup> Annual Lespedeza	2	2
Big Bluestem	1	1.5
Indiangrass	1.5	2
Little Bluestem	1	0.5
Sideoats Grama	0.5	0.5
<sup>3</sup> Annual Lespedeza	2	2

<sup>1</sup> If prepackaged mixtures are used the application rates shall be equal to those listed in Table 4 for the designated use.

<sup>2</sup> Pure Live Seed. To calculate percent Pure Live Seed (PLS) rates, multiply the percent purity by the percent germination. Divide the seeding rate by the %PLS to find the bulk seed needed per acre.  
Example: 98% Purity X 60% Germination = .588 PLS, 10 pounds seed per acre/.588 PLS = 17 pounds of bulk seed per acre.

<sup>3</sup> any of the forb species listed in the box below can be substituted for Annual Lespedeza. Substitutes must be used on sites north of Interstate 70.

<sup>4</sup> this seeding mixture can be used on wet sites.

**Note:** For added wildlife and aesthetic benefits or to substitute for one of the legumes in the seeding mixtures listed in Tables 4 and 5, add 2 to 8 oz. of any single or combination of forb species listed below.

#### Forb Species

Blackeyed Susan	Illinois Bundle Flower	Stiff Goldenrod
Butterflyweed	New England Aster	Sunflower Heliothis
Button Blazing Star	Partridge Pea	Tall Coreopsis
Dense Blazing Star	Prairie Dock	Virginia Mountain Mint
Entire-Leaf Rosinwood	Purple Coneflower	Wild Bergamot
Gray-Headed Coneflower	Sawtooth Sunflower	

**Guidance for when to use wildlife or vegetative seeding rates.**

	<b>Wildlife Rate</b>	<b>Vegetative Rate</b>
<b>Northern Indiana</b>	LS =< 0.39	LS => 0.40
<b>Southern Indiana</b>	LS =< 0.79	LS => 0.80

The **wildlife rates** are to be used for the flatter portions of fields that are less erosive. The **vegetative rates** are for the slopes, drainage ways, and other more erosive areas of the field. Planners should look at LS values to help determine the break between the vegetative rates and wildlife rates. Adapt application rates in Tables 4 and 5 to meet local conditions.

(For more information on LS values refer to USDA Agricultural Handbook 703.)

**Table 5. Seeding Mixtures for Cool Season Grass, Legume and Forb Species.**

Seeding Mixtures	Application Rate (lbs./ac of PLS)	
	Wildlife	Vegetative
<sup>1,2</sup> Orchardgrass	2	6
Timothy	1	2
Annual Lespedeza	2	4
Ladino Clover	¼	¼
<sup>1</sup> Redtop	1	2
Orchardgrass	2	6
Annual Lespedeza	2	4
Ladino Clover	¼	¼
<sup>1</sup> Redtop	1	2
Timothy	1	2
Red Clover	1	2
Annual Lespedeza	2	4
Orchardgrass	2	6
Timothy	1	2
Alfalfa	3	6
Ladino Clover	¼	¼
<sup>3</sup> Smooth Bromegrass	5	10
Alfalfa	3	6
Ladino Clover	¼	¼
Birdsfoot Trefoil	2	4
<sup>4</sup> Timothy	1	2
Smooth Bromegrass	5	10
Alsike Clover	½	1
Birdsfoot Trefoil	2	4
<sup>1</sup> Timothy	1	2
Kentucky Bluegrass	1	3
Annual Lespedeza	2	4
Birdsfoot Trefoil	2	4

Seeding Mixtures	Application Rate (lbs./ac of PLS)	
	Wildlife	Vegetative
<sup>4</sup> Redtop	1	2
Timothy	1	2
Alsike Clover	1	2
Birdsfoot Trefoil	2	4
<sup>1</sup> Redtop	1	2
Kentucky Bluegrass	1	3
Annual Lespedeza	2	4
Ladino Clover	¼	¼
<sup>1</sup> Orchardgrass	1	6
Timothy	1	2
Red Clover	1	2
Ladino Clover	¼	¼
Annual Lespedeza	2	4
<sup>3</sup> Smooth Bromegrass	5	10
Timothy	1	2
Ladino Clover	¼	¼
Birdsfoot Trefoil	2	4
<sup>1</sup> Orchardgrass	2	6
Timothy	1	2
Red Clover	1	2
Sweet Clover	1 ½	3
<sup>1</sup> Timothy	1	2
Kentucky Bluegrass	1	3
Annual Lespedeza	2	4
Red Clover	1	2
Orchardgrass	2	6
Timothy	1	2
Ladino Clover	¼	¼
Birdsfoot Trefoil	2	4

<sup>1</sup> Better suited for sites south of Interstate 70.

<sup>2</sup> can be used on droughty sites

<sup>3</sup> better suited for sites north of Interstate 70.

<sup>4</sup> can be used on wet sites

## CONSIDERATIONS

### General

Soils and site potential should indicate which plant species to select.

Irregular edges on plantings and transition areas are preferred over straight or square plantings.

Prevent improper use of wildlife areas by livestock.

Consider developing wildlife management plans with assistance from an NRCS Biologist, IDNR District Wildlife Biologist, or FWS Biologist when a plan is large or complex. Planners should seek assistance for plans addressing the needs of multiple wildlife species or for sites 5 acres or larger.

### Food

Consider developing one food plot for every 40 acres of land as a minimum, not to exceed 5% of total planned acreage.

Consider locating food plots in the least erosive areas of the field, and dispersing evenly.

Consider making food plots at least 30 feet wide, not to exceed ¼ acre. In high deer density areas, food plots may be planted in squares.

Consider leaving grain strips along field edges, adjacent to other cover types.

Consider inter-seeding legumes into the existing cool season grass stands to provide a needed food source and add plant diversity to attract greater insect populations.

Weed control is not required as the presence of some forbs, such as foxtail, smartweeds and ragweed actually benefit wildlife by providing higher protein and greater number of seeds than domestic grains.

Consider planting up to 50% pine and softwood trees throughout the plantation as trainer trees.

Consider the use of potted stock to establish trees on sites where wildlife habitat is the primary concern and soft or hard mast production is a limiting factor for the species of wildlife being considered. This method of tree planting is to be used where “old field” habitat with scattered trees is desired. Select only species adapted to the site giving preference to hard mast species. Species typically associated with woodland edges and old-field habitats will benefit most from this type of management. This practice is not intended for use where grassland or interior woodland species are the primary species of concern.

Consider using potted stock to produce fruit in a shorter amount of time than trees established utilizing conventional seedling planting methods. Wide spacing and additional height, trees planted in this manner will develop into trees, which will reach maturity sooner than trees, which are established through natural regeneration. The containerized trees will consequently be able to produce fruit and mast as a food source for wildlife more quickly than in traditional seedling plantings. Native trees, shrubs, and forbs will establish around the containerized trees pioneering from the surrounding woodlands or brought in from floodwaters.

Consider using natural regeneration if the sites have a seed source from adjacent wooded areas or from a forested flood plain system where seeds are deposited. Natural regeneration of light seeded species (e.g. green ash, silver maple, cottonwood and others) is likely to establish large numbers of tree seedlings. For wildlife purposes, natural regeneration is generally acceptable for a distance of 300 feet from a woods edge. Natural regeneration is also considered likely on frequently flooded-forested flood plains.

### Cover

Consider Emphasizing placement of tree and shrub plantings, which connect, isolated wooded sites.

Norway Spruce, a non-native to Indiana, may be used in cases where severe deer problems exist.

Brush piles of at least 15'x15'x8' can be developed with the material left from forest stand improvement or opening development. Place piles adjacent to food plots or along woodland edges.

## PLANS AND SPECIFICATIONS

Plans and specifications for this practice shall be prepared for each site. Plans and specifications shall be recorded using approved specification sheets, job sheets, technical notes, or narrative documentation in the conservation plan, or other acceptable documentation.

Management plans will contain, at a minimum:

- ◆ Primary species of concern, as determined by land user.
- ◆ Habitat limitations and how limitations will be addressed.
- ◆ Site map.
- ◆ Seeding recommendations for all habitat elements.
- ◆ Watering information based on species.
- ◆ Food plot maintenance plan, if needed.

## OPERATION AND MAINTENANCE

A plan for operation and maintenance of upland wildlife habitat at a minimum shall include monitoring and management of structural and vegetative measures. Actions will be carried out to ensure these practices function as intended throughout their expected lives. These actions include normal repetitive activities in the application and use of the practice (operation) such as prescribed fire, disking, or mowing, and repair and upkeep of the practice (maintenance) such as replacement of vegetative component as needed.

Management measures shall be provided to control invasive species and noxious plants on a "spot" basis.

During the establishment period for trees and shrubs, a minimum of 2 years of weed control is standard with a possible 3<sup>rd</sup> year when necessary due to weed competition.

If mowing is necessary, mow between July 15 – August 15 to protect ground nesting wildlife and allows residual growth. Mow no more than 1/4 or 1/3 of the field every year. Rotate mowed strips across the field every year. Mow cool season grasses no shorter than 6 inches and native warm season grasses no shorter than 10 inches.

Use prescribed burning (338), light strip disking, haying or grazing to remove excess litter. If grazing or prescribed burning is used, it shall be in accordance with a prescribed plan.

Manage habitat elements in proper amounts and locations to benefit desired wildlife species.

Apply supplemental nutrients only as needed to maintain the desired species composition and stand density.

When using potted stock, weed control is important to insure plant survival. If used, weed barrier fabric squares can effectively control competing vegetation. The minimum width of weed barrier materials is 3 feet and shall be installed according to manufacturer directions. The weed barrier should be permeable, have a minimum thickness of 15 mil, be capable of preventing underlying plant growth, and last a minimum of three years after placement. Where non-native invasive species are a problem, appropriate control measures will be taken.

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